□□□ □□□□□□

1. □□□□□□□□□□□□□□□□□□

2. □□□□□□□□□□a_n□□ ***n*** □□□□S_n□□□□

3. □□□□ ***n*** □□□□S_n□□□□□□□□□□a_n.

(1)□□
(2)□□□□□□□□□□□□
(3)□□□□□□□□□□□□□□
(4)□□□□□□□□□□□
(5)□□□□□□□□□□□ **n** □□□□□□□□□□□
(6)□□□□□□□□□□***a***$_1$□a_n□***n***□***d***(***q***)□S_n "□□□□"□□□□□□
(□)□□□□□□□□□□□□□□□□□□□

4□□□□□□□□□ ***n*** □□□□□□□□□□□□□ **1**□□□□□□□□□□□□□□□□□□□□□□□□□

5□□□□□□□□□□□□□

①□□□

$$1^2+2^2+3^2+\cdots n^2=\frac{n(n+1)(2n+1)}{6}$$□

$$1^3+2^3+\cdots n^3=[\frac{1}{2}n(n+1)]^2.$$

②□□□
③□□□□□
④□□□□
⑤□□□□
⑥□□□□

□□□□□□□□□□□□□□

1.□□□$\{a_n\}$□□a_1□**1**□n≥**2**□□a_n□S_n□S_n□$\frac{1}{2}$□□□□□.

□**1**□□a_2,a_3,a_4□ □**2**□□□□$\{a_n\}$□□□□□.

2.□□□$\{a_n\}$□□□□□□□□□□□□□□□□□□ **12**□ □□□□□□ **48**□□□□□□□□□ □.

A. 1 **B.** 2 **C.** 4 **D.** 8

□□□□□□□□

(□)□□□

□□□□

$$S_n=\frac{n(a_1+a_n)}{2}=na_1+\frac{n(n-1)d}{2}$$
$$=\frac{d}{2}n^2+(a_1-\frac{d}{2})n=An^2+Bn$$

□□□□

$$S_n=\begin{cases}na_1\ (n=1)\\ \frac{a_1(1-q^n)}{1-q}\ (n\ge 2,n\in N^*)\end{cases}$$
$$=Aq^n+B(A+B=0)$$

1.□$\{a_n\}$□□□□□ **1** □□□□□□S_n□□□$\{a_n\}$□□n□□□□□

$S_3=7$□□a_1+3□$3a_2$□a_3+4□□□□□□□

□**1**□□a_n;□**2**□□$b_n=\ln a_{3n+1}$□$n=1$□2□$\cdots$□□□□$\{b_n\}$□□n□□T.

2.□□□□□□$\{a_n\}$□□□ a_1□**1**□□□ d>**0**□□□ **2** □□□ **5** □□□ **14** □□□□□□□$\{b_n\}$□□ **2** □□ **3** □□ **4** □□
□**1**□□□□$\{a_n\}$□$\{b_n\}$□□□□□□
□**2**□□□□$\{c_n\}$□□□□□ n□□□

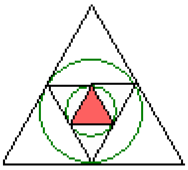
$$\frac{c_1}{b_1}+\frac{c_2}{b_2}+\frac{c_3}{b_3}+\cdots\cdots+\frac{c_n}{b_n}=a_{n+1}$$□

□ c_1□c_2□c_3□…□c_{2004}□□□

3.□□□□□$\{a_n\}$□□$a_1=1$□$a_n=\frac{2S_n^2}{2S_n-1}$□□$\{a_n\}$□□□□□□

____

4.□□□□□□□□a□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□.□□□□□□□n□□□□□□□□□.



5.□□□□□□□□ □□□□□ □n□□□□□□□n^2□ □□□**20** □□□□□□□□□?□**20** □□□□□□□□□?

		1		
	2	3	4	
5	6	7	8	9

□□□□□□□□□□
□□□□□□

□**1**□$\frac{1}{n(n+k)}=\frac{1}{k}(\frac{1}{n}-\frac{1}{n+k})$

□**2**□$\frac{(2n)^2}{(2n-1)(2n+1)}=1+\frac{1}{2}(\frac{1}{2n-1}-\frac{1}{2n+1})$

□**3**□$\frac{1}{n(n+1)(n+2)}=\frac{1}{2}(\frac{1}{n(n+1)}-\frac{1}{(n+1)(n+2)})$

□**4**□

$$n(n+1)(n+2)=\frac{1}{4}[n(n+1)(n+2)(n+3)-(n-1)n(n+1)(n+2)]$$

□**5**□$\frac{n+2}{n(n+1)2^n}=\frac{1}{n\cdot 2^{n-1}}-\frac{1}{(n+1)\cdot 2^n}$

□**6**□$n\cdot n!=(n+1)!-n!$

□**7**□$\frac{n}{(n+1)!}=\frac{1}{n!}-\frac{1}{(n+1)!}$

1.□□□$\frac{1}{1+\sqrt{2}},\frac{1}{\sqrt{2}+\sqrt{3}},\cdots;\frac{1}{\sqrt{n}+\sqrt{n+1}},\cdots$□□**n**□□.

2. □□□□□□ $y=f(x)$□□□□□□□□□□□□□□□

$f'(x)=6x-2$□□□$\{a_n\}$□□**n**□□□S_n□□$(n,S_n)(n\in N^*)$□□□□$y=f(x)$□□□□□

□**I**□□□□$\{a_n\}$□□□□□□□**II**□□$b_n=\dfrac{1}{a_na_{n+1}}$□$T_n$□□□$\{b_n\}$□□**n**□□□□□□$T_n<\dfrac{m}{20}$□□□$n\in N^*$□□□□□□□□□**m**□

3.□□□□**$\{a_n\}$**□□□□□□□□□□**a_1□a_4□9□a_2a_3□8.**

(1)□□□**$\{a_n\}$**□□□□□□

(2)□**S_n**□□□**$\{a_n\}$**□□**n**□□□**b_n**□□□□□**$\{b_n\}$**□□**n**□□**T_n.**

4.□□$\{a_n\}$□□□□□□$\{b_n\}$□□□□□□□□□□□□□□□□$a_1=1;b_1=4$□

$a_2+b_2=10$; $a_2 6- b_3=10$□

(1)□□□$\{a_n\}$□$\{b_n\}$□□□□□□

□**2**□□$C_n=a_nb_n$□□□□$\left\{\dfrac{C_{n+2}}{C_nC_{n+1}}\right\}$□□**n**□□$S_n$.

5.□$f(x)=\ln\dfrac{1+x}{1-x}$□□

$f(\frac{1}{5})+f(\frac{1}{11})+\ldots+f(\frac{1}{n^2+3n+1})$

6.□□$a_1=1$□$a_{n+1}=a_n^2+2a_n$□

(1)□□□□□$\{\log_2(a_n+1)\}$□□□□□□

(2) $b_n=\dfrac{1}{a_n}+\dfrac{1}{2+a_n}$□□$b_n$□□**n**□□.

7.□□$\{a_n\}$□□$a_1=2,a_{n+1}=a_n^2+6a_n+6(n\in N^*)$.

□**1**□□a_n□**2**□□$b_n=\dfrac{1}{a_n-6}-\dfrac{1}{a_n^2+6a_n}$,□□□$\{b_n\}$□□**n**□□□□$T_n\in[-\frac{5}{16},-\frac{1}{4})$.

8.□□$a_n=\dfrac{n+2}{n!+(n+1)!+(n+2)!}$□□$\{a_n\}$□□**100**□□□

□□□□□□□□

1.□$\{a_n\}$□□□□□□$\{b_n\}$□□□□□□□□□□□□□□$a_1=b_1=1$□$a_3+b_5=21$□$a_5+b_3=13$

□**I**□□$\{a_n\}$□$\{b_n\}$□□□□□□

□**II**□□□□$\left\{\dfrac{a_n}{b_n}\right\}$□□**n**□□$S_n$□

2.□□□$S_n=1\cdot3+4\cdot3^2+\cdots+n^2\cdot3^n$

□□□□□□□□

1.□□□$f(x)=\dfrac{2^x}{2^x+\sqrt{2}}$□□□□□□□**$P_1(x_1,y_1)$**□**$P_2(x_2,y_2)$**□□$\overrightarrow{OP}=\frac{1}{2}(\overrightarrow{OP_1}+\overrightarrow{OP_2})$**,**□□**P**□□□□□$\frac{1}{2}$.

□**I**□□□□**P**□□□□□□□□□□□□□□□□□□□

(II□□$S_n=f(\frac{1}{n})+f(\frac{2}{n})+f(\frac{3}{n})+\cdots+f(\frac{n}{n}),\ n\in N^*$,□$S_n$;

2.□$f(x)=x^3-3x^2$□□[illegible].

3.□□[illegible]□

□[illegible]□$T_m=S_1+S_2+\cdots S_m$□□$T_m<11$□□**m**□□□□

□□□□□□□□

1.□□**$\{a_n\}$**□□**n**□□$S_n=2a_n-1$□□□**$\{b_n\}$**□$b_1=3,b_{n+1}=a_n+b_n(n\in N^*)$.

□**I**□□□□□**$\{a_n\}$**□□□□□□□**II**□□□□**$\{b_n\}$**□□**n**□□**T_n**□

2. □□□**1**□$7+77+777+\underbrace{7\cdots7}_{n个7}$

□**2**□

$2020+20202020+202020202020+\cdots\cdots+\underbrace{2020\cdots\cdots2020}_{n个2020}$

□□□□□□□

1.□□□□□□□□□□□**n**□□

□**1**□$a_n=n^2$ □**2**□$1\cdot n+2\cdot(n-1)+\cdots n\cdot1=$

□3□ $a_n = 2\cdot 3^{n-1} + (-1)^n \lg(2\cdot 3^{n-1})$

2.□□□□□□□□□□□n□□

(1)□ $S_n = 1-5+9-13+\cdots+(-1)^{n-1}(4n-3)$ □□

$S_{15}+S_{22}-S_{31}=$______

(2)□ $S=1^2-2^2+3^2-4^2+\cdots+(-1)^{n-1}n^2$ □ $n\in N_+$ □

(3)□□□ $\{a_n\}$ □□ $a_n = n^2(\cos^2\frac{n\pi}{3}-\sin^2\frac{n\pi}{3})$ □□□□**n**□ □ $S_n=$______

□□□□□□□□□□□□□

□□□□□□□□□□□□

□□□□□□

□**1**□□□□□□□

□**2**□□□□□□□

□**3**□□□□□ $a_n=\begin{cases}S_n \cdots\cdots n=1\\ S_n-S_{n-1}\cdots n\ge 2\end{cases}$

1.□□□□□□□ $\{a_n\}$ □□ n □□□ S_n □□□ $a_n+S_n=1(n\in N^*)$ □ □ a_n

2. □□□□ $\{a_n\}$ □□ n □□ S_n □□□□□ $\lg(S_n+1)=n$ $(n=1,2\cdots)$.□□□□ $\{a_n\}$ □□□□□.

3. □□□□ $\{a_n\}$ □□ $a_1=1$, $a_n=a_1+2a_2+3a_3+\cdots+(n-1)a_{n-1}(n\ge 2)$.□ a_n

4.□□□□□□□□□□□{a_n}□□ n □□□□ $S_n>1$□□ $6S_n$□(a_n□1)(a_n□2)□$n\in N^*$□□{a_n}□□□□□□

5. □□□□ $\{a_n\}$ □□□□□□□ $\frac{4S_1}{a_1+2}+\frac{4S_2}{a_2+2}+\cdots+\frac{4S_n}{a_n+2}=S_n$ □□ a_n

6.□□□□ $\{a_n\}$ □□□□□□□□□ $S_n=\frac{1}{2}\left(a_n+\frac{1}{a_n}\right)$ □□ a_n

7.□□ $\{a_n\}$ □□ $a_1=0, a_{n+1}+a_n=2n$ □□ $a_{2015}=$______

□□□□□□

1.□□□□ $\{a_n\}$ □□ $a_1=\frac{1}{2}$□ $a_{n+1}=a_n+\frac{1}{n^2+n}$ □□ a_n.

2.□□ $a_1=\frac{1}{2}$, $a_{n+1}=a_n+\left(\frac{1}{2}\right)^n (n\in N^*)$,□□□ $\{a_n\}$ □□□□.

□□□□□□ □□$a_{n□1}$□$a_nf(n)$□□a_n

1.□□□□ $\{a_n\}$ □□ $a_1=\frac{2}{3}$□ $a_{n+1}=\frac{n}{n+1}a_n$ □□ a_n.

2. □□□ $\{a_n\}$□ □ $a_1=1$□ $a_1+2a_2+3a_3+\ldots\ldots+na_n=\frac{n+1}{2}a_{n+1}(n\in N^*)$□ □ a_n

□□□□□□

□**1**□□□□□□ □**2**□□□□

□**3**□□□□ □**4**□□□□□□

□**5**□□□□□

□□□□**2009**□□□**II**□□□□□ $\{a_n\}$ □□ n □□□ S_n, □□ $a_1=1$, $S_{n+1}=4a_n+2$

□**I**□□ $b_n=a_{n+1}-2a_n$ □□□□□ $\{b_n\}$ □□□□□

□**II**□□□□ $\{a_n\}$ □□□□□□

□□□**I**□□ $a_1=1$,□ $S_{n+1}=4a_n+2$ □□ $a_1+a_2=4a_1+2$,

$a_2=3a_1+2=5,\therefore b_1=a_2-2a_1=3$

□ $S_{n+1}=4a_n+2$ □□□□①

□□ $n\ge 2$ □□□ $S_n=4a_{n-1}+2$ □□□□□②

②□①□

$a_{n+1}=4a_n-4a_{n-1},\therefore a_{n+1}-2a_n=2(a_n-2a_{n-1})$

□∵ $b_n=a_{n+1}-2a_n$，□∴ $b_n=2b_{n-1}$

∴$\{b_n\}$□□□$b_1=3$□□□□□□□□□□□

□II□□□I□□□$b_n=a_{n+1}-2a_n=3\cdot 2^{n-1}$，∴$\frac{a_{n+1}}{2^{n+1}}-\frac{a_n}{2^n}=\frac{3}{4}$

∴□□$\{\frac{a_n}{2^n}\}$□□□□$\frac{1}{2}$□□□□$\frac{3}{4}$□□□□□□

∴ $\frac{a_n}{2^n}=\frac{1}{2}+(n-1)\frac{3}{4}=\frac{3}{4}n-\frac{1}{4}$，$a_n=(3n-1)\cdot 2^{n-2}$

1.□**1**□□□□□$\{a_n\}$□□$a_1=1$，$a_n=2a_{n-1}+1(n\geq 2)$□□□□$\{a_n\}$□□□□□.

(2)□□□□$\{a_n\}$□□$a_1=\frac{5}{6}$，$a_{n+1}=\frac{1}{3}a_n+(\frac{1}{2})^{n+1}$□□$a_n$.

(3)□□□□$\{a_n\}$□□$a_1=1, a_{n+1}=\frac{1}{2}a_n+\left(\frac{1}{2}\right)^{n+1}$，□$a_n$

(4)□□□□$\{a_n\}$□□$a_1=1$，$a_{n+1}=2a_n+3n-1$，□□□$\{a_n\}$□□□□□.

(5) □□□□$\{a_n\}$□□□$a_1=\frac{3}{2}$，□ $a_n=\frac{3na_{n-1}}{2a_{n-1}+n-1}\left(n\geq 2, n\in N^*\right)$□□□□$\{a_n\}$□□□□□□_______

2.□□□□□$\{a_n\}$□□$a_n\neq 0, a_1=2$□□$a_{n+1}-a_n=2a_{n+1}a_n$

3.□□□□$\{a_n\}$□□$a_1=1, a_2=3$□□$a_{n+2}-2a_{n+1}+a_n=4$□□a_n

4.□□□□$\{a_n\}$□□$(a_{n+1}-1)(a_n-1)=3(a_n-a_{n+1})$□$a_1=2$□□$\{a_n\}$□□□□□

5.□□□$\{a_n\}$□□□$a_1=1, a_2=2$□□□□□□□□□□□□□□a_{n-1}, a_n, a_{n+1}□□□□$a_n=\frac{(n-1)a_{n-1}+(n+1)a_{n+1}}{2n}$□□$\{a_n\}$□□□□

6.□□□□□□□□□□

①□□□□□□□□□□$a_1=m_1, a_2=m_2,$ **$a_{n+2}=A a_{n+1}+B a_n$**

(A□B □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□□□□□□□□□□□□□□□□□
□□□□□□**$x^2-Ax-B=0$** □□□□□□□□□
□**i**□□□□□□□□□□□□□□□□□□□***p***□***q***□□□□
$a_n=c_1\cdot p^n+c_2\cdot q^n$□□□***$c_1$***□***$c_2$***□□□$a_1=m_1, a_2=m_2,$□□□
□**ii**□□□□□□□□□□□***p***□□□$a_n=(c_1\cdot n+c_2)p^n$□□□***c_1***□***c_2*** □□□$a_1=m_1, a_2=m_2,$□□□
□□□□□□□$a_{n+2}-x_1a_{n+1}=x_2(a_{n+1}-x_1a_n)$□□**{** $a_{n+1}-x_1a_n$**}**□□□□□□□□□□□□□□□□□□□□□□□□□□□□
□**1**□□□ ***a_1* =2**□ ***a_2* =3**□$a_{n+2}=2a_{n+1}-a_n$□□□□□□.
□□□□□□□□□□□□**1**□□□***a_n* = (*c_1* n+*c_2*)×1^n**
□□$\begin{cases}c_1+c_2=2\\2c_1+c_2=3\end{cases}$□***$c_1$* = *$c_2$* = 1**□□□***$a_n$* = n + 1.**

□□□□□$a_{n+2}-x_1a_{n+1}=x_2(a_{n+1}-x_1a_n)$□□□***$x_1$* = *$x_2$* = 1**□□□**{*$a_{n+1}$*□*$a_n$* }**□□□□**1** □□□□□□***$a_{n+1}$***□***$a_n$* = 1**□□□***$a_n$* = *n* + 1.**
□ **2** □□□□□ $\{a_n\}$□□ $a_1=2, a_2=3, a_{n+2}=3a_{n+1}-2a_n(n\in N^*)$□□□□$\{a_n\}$□□□$a_n$.

□□□□□□□□$x^2=3x-2$□□□$x_1=1, x_2=2$□□

$a_n=c_1\cdot 1^n+c_2\cdot 2^n$□

□ $\begin{cases}a_1=c_1+2c_2=2\\a_2=c_1+4c_2=3\end{cases}$□ □ $\begin{cases}c_1=1\\c_2=\frac{1}{2}\end{cases}$□

$\therefore a_n=1+2^{n-1}$□

□ 3 □ □ 2009 □□□□□□□□□ $\{a_n\}$**□□□**

a_1□$1, a_2=2, a_{n□2}$□$\frac{a_n+a_{n+1}}{2}, n\in N^*$.

(I)□$b_n=a_{n+1}-a_n$□□□□$\{b_n\}$□□□□□□

(II)□$\{a_n\}$□□□□□□

□□□**1**□□□□$b_1=a_2-a_1=1$,

□$n\geq 2$□□$b_n=a_{n+1}-a_n=\frac{a_{n-1}+a_n}{2}-a_n=-\frac{1}{2}(a_n-a_{n-1})=-\frac{1}{2}b_{n-1}$,

□□$\{b_n\}$ □□**1**□□□□$-\frac{1}{2}$□□□□□□□□□

□**2**□□□□**1**□□$b_n=a_{n+1}-a_n=(-\frac{1}{2})^{n-1}$,

□ $n\geq 2$□ □

$$a_n=a_1+(a_2-a_1)+(a_3-a_2)+\cdots+(a_n-a_{n-1})$$

$$=1+1+(-\frac{1}{2})+\cdots+(-\frac{1}{2})^{n-2}$$

$$=1+\frac{1-(-\frac{1}{2})^{n-1}}{1-(-\frac{1}{2})}$$

$$=1+\frac{2}{3}[1-(-\frac{1}{2})^{n-2}]=\frac{5}{3}-\frac{2}{3}(-\frac{1}{2})^{n-1},$$

□$n=1$□□$\frac{5}{3}-\frac{2}{3}(-\frac{1}{2})^{1-1}=1=a_1$□

□□$a_n=\frac{5}{3}-\frac{2}{3}(-\frac{1}{2})^{n-1}(n\in N^*)$□

□□□□□□□□□□□□□□**,**□□□□□□□□□□**.**

②□□□□□□$a_{n+1}=\frac{a\cdot a_n+b}{c\cdot a_n+d}$□***a***□***b***□***c***□***d***□□□□

□□□□□□□□□□□$x=\frac{ax+b}{cx+d}$□□□□□□

$cx^2+(d-a)x-b=0$□□□□□□□□□□□□□□□□□□□□**.**

□**i**□□□□$cx^2+(d-a)x-b=0$□□□□□□□□□□□□□□

$\left\{\frac{a_n-p}{a_n-q}\right\}$□□$\frac{a_1-p}{a_1-q}$□□□□$\frac{a-cp}{a-cq}$□□□□□□□□□

□**ii**□□□□$cx^2+(d-a)x-b=0$□□□□□□□□□□□□□

$\left\{\frac{1}{a_n-p}\right\}$□□$\frac{1}{a_1-p}$□□□□$\frac{2c}{a+d}$□□□□□□□□**.**

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$a_1=a,a_2=b$□□□□□$m+n=p+q$□□□□m,n,p,q□□

$$\frac{a_m+a_n}{(1+a_m)(1+a_n)}=\frac{a_p+a_q}{(1+a_p)(1+a_q)}.$$

□**1**□□$a=\frac{1}{2},\ b=\frac{4}{5}$□□□□□$a_n$;

□□□**1**□□$\frac{a_m+a_n}{(1+a_m)(1+a_n)}=\frac{a_p+a_q}{(1+a_p)(1+a_q)}$□

$\frac{a_1+a_n}{(1+a_1)(1+a_n)}=\frac{a_2+a_{n-1}}{(1+a_2)(1+a_{n-1})}$.□$a_1=\frac{1}{2},a_2=\frac{4}{5}$□□

□□□

$$a_n=\frac{2a_{n-1}+1}{a_{n-1}+2}.$$

□□□□$x=\frac{ax+b}{cx+d}$**(a=2,b=1,c=1,d=2)**□□□□$x^2=1$

□□**x=1**□**-1.**

□□□□$\{\frac{1-a_n}{1+a_n}\}$□□□□□□

□□$\frac{1-a_n}{1+a_n}=\frac{1}{3}\cdot\frac{1-a_{n-1}}{1+a_{n-1}}$,

□□□$\frac{1-a_n}{1+a_n}=\frac{1}{3^n}$,□$a_n=\frac{3^n-1}{3^n+1}$.

□□□□$a_n=\frac{3^n-1}{3^n+1}$□□□□□□**.**

[illegible] **5** [illegible] $\{a_n\}$ [illegible] $a_1=2, a_n=\frac{a_{n-1}+2}{2a_{n-1}+1}\ (n\geq 2)$ [illegible]

$\{a_n\}$ [illegible] a_n [illegible]

[illegible] $x=\frac{x+2}{2x+1}$ [illegible] $2x^2-2=0$ [illegible]

$x_1=1, x_2=-1$ [illegible] $\frac{a_{n+1}-1}{a_{n+1}+1}=c\cdot\frac{a_n-1}{a_n+1}$

[illegible] $a_1=2,$ [illegible] $a_2=\frac{4}{5}$ [illegible] $c=-\frac{1}{3}$ [illegible]

$\therefore$ [illegible] $\left\{\frac{a_n-1}{a_n+1}\right\}$ [illegible] $\frac{a_1-1}{a_1+1}=\frac{1}{3}$ [illegible] $-\frac{1}{3}$ [illegible]

$\therefore\frac{a_n-1}{a_n+1}=\frac{1}{3}\cdot\left(-\frac{1}{3}\right)^{n-1}$ [illegible] $\therefore a_n=\frac{3^n-(-1)^n}{3^n+(-1)^n}$ [illegible]

[illegible]

1. [illegible]

2. [illegible]

3. [illegible] **n** [illegible]

4. [illegible]